UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/604,876	06/28/2000	Mercy M. Davidson	0575/56614/JPW/JML/HA	6365

7590 02/15/2002

Cooper & Dunham LLP
1185 Avenue of the Americas
New York, NY 10036

EXAMINER
PURI, BEENA

ART UNIT	PAPER NUMBER
1632	7

DATE MAILED: 02/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/604,876	Applicant(s) DAVIDSON, MERCY M.	
	Examiner Beena Puri	Art Unit 1632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *13-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The filing date for the instant application is June 28, 2000.

2. Applicant's election of group I (claims 1-12) with traverse drawn to "An immortalized human cardiomyocyte cell lines," filed on 10/30/01, Paper No. 6, is acknowledged. Claims 13-19 from the nonelected group II have been withdrawn from consideration.

3. Applicant's arguments filed on 10/30/01, Paper No. 6, is acknowledged. The traversal is on the ground(s) that there is no serious burden to examine all of the claims in a single invention. Applicant further argues that group I and II are not independent and restriction is not proper. Applicant further argues that a search of the prior art relevant to the claims of Group II would not require a serious burden once the prior art relevant to Group I has been identified.

Applicant's arguments are not persuasive because inventions can be dependent but still restrictable if they are distinct and would be burdensome to search together. In the instant case, the inventions are distinct and are classified in different subclasses. A search of one group would not be co-extensive with a search of the other group and hence would be burdensome.

The requirement is still deemed proper and is therefore made FINAL.

4. ***Drawings***

The drawings have been reviewed and are objected under 37 CFR 1.84 or 1.152. See attached Notice of Draftsperson's patent Drawing review.

5. ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim(s) 2 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor (s), at the time the application was filed, had possession of the claimed invention.

The written description guidelines indicate that the written description requirement for a claimed genus can be satisfied through sufficient description of a representative number of species by actual to practice or by disclosure of relevant identifying characteristic, i.e. structure or other physical properties and/or chemical properties, by functional characteristic coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristic, sufficient to show applicant was in possession of claimed genus. In the instant case, applicants present only one example of the claimed invention. Given that the claimed genus reads on an immortalized human vascular smooth cell line and given that the single disclosed example would provide no conception of what other vascular smooth cell lines derived from other human species would look like, the skilled artisan would not conclude that the single disclosed example would provide support for the claimed genus. Since applicants are claiming the immortalized human vascular smooth cell lines by function (i.e. which express the large T-antigen in Fig. 4A and mitochondrial function

exhibited by normal succinate dehydrogenase activity in Fig. 4B) without providing an art recognized or disclosed correlation between their structure and their function, the skilled artisan would conclude that applicants' were not in possession of the claimed genus.

6. Claims 11 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The invention consists of one fibroblast cell line designated DWFb1. Since fibroblast cell line is essential to the claimed invention, it must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. The specification does not teach how this cell line was derived or if it is publically available. If the cell lines is not so obtainable or available, the requirements of 35 U.S.C. 112, regarding "how to make", may be satisfied by a deposit of cell lines. It is noted that Applicant has not deposited the cell line with ATCC. If the deposits are made under the terms of the Budapest Treaty, then an affidavit or declaration by Applicant, or a statement by an attorney of record over his or her signature and registration number, stating that the specific cell lines have been deposited under the Budapest Treaty and that the cell lines will be irrevocably and without restriction released to the public upon the issuance of a patent, would satisfy the deposit requirement.

If the deposit has not been made under the Budapest Treaty, then in order to certify that the deposit meets the criteria set forth in 37 CFR 1.801-1.809, Applicant may

exhibited by normal succinate dehydrogenase activity in Fig. 4B) without providing an art recognized or disclosed correlation between their structure and their function, the skilled artisan would conclude that applicants' were not in possession of the claimed genus.

6. Claims 11 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The invention consists of one fibroblast cell line designated DWFb1. Since fibroblast cell line is essential to the claimed invention, it must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. The specification does not teach how this cell line was derived or if it is publically available. If the cell lines is not so obtainable or available, the requirements of 35 U.S.C. 112, regarding "how to make", may be satisfied by a deposit of cell lines. It is noted that Applicant has not deposited the cell line with ATCC. If the deposits are made under the terms of the Budapest Treaty, then an affidavit or declaration by Applicant, or a statement by an attorney of record over his or her signature and registration number, stating that the specific cell lines have been deposited under the Budapest Treaty and that the cell lines will be irrevocably and without restriction released to the public upon the issuance of a patent, would satisfy the deposit requirement.

If the deposit has not been made under the Budapest Treaty, then in order to certify that the deposit meets the criteria set forth in 37 CFR 1.801-1.809, Applicant may

provide assurance of compliance by an affidavit or declaration, or by a statement by an attorney of record over his or her signature and registration number, showing that

(a) during the pendency of this application, access to the invention will afforded to the Commissioner upon request;

(b) all restrictions upon availability to the public will be irrevocably removed upon granting of the patent;

(c) the deposit will be maintained in a public depository for a period of 30 years or 5 years after the last request of for the effective life of the patent, whichever is longer; and,

(d) a test of viability of the biological material at the time of deposit (see 37 CFR 1.807); and,

(e) the deposit will be replaced if it should ever become inviable.

7. Claims 7 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The instant claim is directed to a method for treating damaged cardiac tissue in a subject, which comprises transplanting the cell line into a subject's heart containing damaged cardiac tissue.

The following factors have been determined by the courts to be critical in determining whether a claimed invention is enabled (See In re Wands 8 USPQ 2d 1400, Fed. Cir. 1988).

The nature of the invention: The instant claim is drawn to a method for treating damaged cardiac tissue in a human which involves the transplantation of immortalized cell lines.

The state of the prior art and the predictability or unpredictability of the art:

The related art considered, cardiomyocyte transplantation, is in it's infancy and is highly unpredictable at the time of filing. Clinical efficacy has not been achieved to replace damaged cardiac tissues in the animal or human by transplanting cardiomyocyte cell lines to date. **Watanabe et al**., (1998) recites: At present, little is known about the fate or survival of the cardiomyocytes that are grafted into a large animal model of chronic myocardial infarction (Cell Transplantation, 1998, 7(3):239-246; page 239, column 1). They again recite: "To date, no reports have been published as to the ability of grafted myocytes to survive in the chronic infarct tissue in the large animal heart. This issue must be addressed before the therapeutic approach of cellular grafting can be realized in human. We delivered HL-1 cells, and both neonatal and fetal pig cardiomyocytes into the chronic infarct area of adult pigs. Unfortunately, no grafted cells were identified in the infarct tissue" (See page 244, column 2). Watanabe also indicates: "Whether or not transplanted cardiomyocytes will ever be able to be successfully used to restore contractile function of the infracted myocardium remains to be determined" (page 245, column 1). **Koh et al.,** (1995) exemplify: "An alternative approach would involve the delivery (or grafting) of healthy myocytes back into the diseased heart. There are numerous rather formidable obstacles which must be

overcome for either approach to be effective" (J. Interventional Cardiology, 1995, 8(4), 387-393, page 387, column 2).

The breadth of the claims and the amount of direction or guidance presented in the specification and the presence or absence of working examples:

As such, the disclosed claim is broad. Claim (7) is drawn to a method of treating damaged cardiac tissue in a human patient. The specification (page 15-20) teaches that human cardiomyocyte cell lines are generated and are characterized as shown in Fig. 1-3. However, the specification does not teach the transplantation of the cell lines into the human. There are no teachings in the specification where the cell lines are integrated into normal or myopathic cardiac tissues. Furthermore, the specification does not teach the treatment of any damaged cardiac tissue by transplanting the cell lines.

Without such guidance from the specification and the lack of correlative working examples, the claims would require an undue amount of experimentation without a predictable degree of success on the part of the skilled artisan.

The quantity of experimentation: To attempt to practice the claimed invention, one of skill in the art would turn to the specification for guidance in practicing the invention. As set forth above, however, the specification lacks sufficient guidance to surmount the technical difficulties recognized in the art. Another source of guidance for one skilled in the art, the prior art, again for reasons set forth above, also lacks solutions to overcome the considerable list of obstacles recognized in the field. In the absence of guidance from the specification and the prior art, one of skilled in the art would resort to experimentation to navigate the obstacles to practicing the claimed invention. Again, as

established above, solutions to these technical problems have been elusive despite an enormous amount of experimentation due to a number of factors, including the unpredictable nature of the art. Such unpredictability would warrant even more experimentation, with no true expectation of a measure of success. The amount of experimentation required to practice the claimed invention embodiments would necessitate undue experimentation on the part of one skilled in the art.

In conclusion, given the nature of the invention, the state of the art, the lack of predictability found in the art, the breadth of the claims, the amount of guidance set forth in the specification, and the working example set forth it is concluded that the amount of experimentation necessary to practice necessary to practice the invention is very high and is in fact undue.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 6 recites the cell line wherein the cell line integrates functionally with normal or myopathic cardiac tissues as determined by measurement of syncitial beating of the tissue. This does not further limit the subject matter of the claim it depends upon because it merely recites a property possessed by the cells of claim I.

9. Claim 1, 3-5, 8-10, &12 are allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beena Puri, Ph. D. whose telephone number is (703)-306-0284. The examiner can normally be reached on 8:00 a. m. EST. to 4:30 p.m. EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Clark can be reached on (703)-305-4051. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-4242 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0196.

Beena Puri, Ph. D.
Patent Examiner
AU1633

bp
February 13, 2002

DAVID GUZO
PRIMARY EXAMINER